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# A contribution to the knowledge of helminth fauna of the lynx and wildcat in Poland

Przyczynek do znajomości helmintofauny rysia i żbika w Polsce

Only an insignificant part of scientific material from the savage *Felidae* representatives reaches the helminthologic laboratories disregarding those animals being relatively numerous in Poland. This is corroborated by the fact that the subject has been so far discussed in isolated publications only (Furmaga 1953).

The present study has been carried out on the material from two *Lynx lynx* L., a male and a female, cought simultaneously on January 7, 1957, in the Białystok Palatinate, and two *Felis sylvestris* Schreb. × *Felis catus* L. hybrides. One of the latter animals was cought on October 5, 1957, in the Otryt tract in the Bieszczady Mountains, while the other — on March 29, 1959, in the Majdan Forestry (Nowy Sącz district); thus, both of the two animals came from the Western Carpathians.

While there was no doubt as to the lynx belonging to a definite species, the definition of the two wildcat hybrides presented, on the contrary, some difficulty and it could not be easily decided which one of *Felis catus* L. or *Felis sylvestris* Schreb. was the dominating characteristics. Besides, the european *Felidae* material designed as *Felis sylvestris* Schreb. may be assumed to represent an intermixture of both of the species mentioned. As the above conditions have probably lasted for more than 100 years, all of the descriptions of the helminthic fauna from „*F. sylvestris*" ought to be considered on the same plane.

The parasitic material from the animals mentioned above was collected by the methods of complete helminthologic section. However, a detailed examination of the nasal sinus cavities, of the brain cavities and the brain itself was left for fear to damage the valuable craniologic material. No trichinae were found in the animals examined by the compression method. A part of the *Nematoda* and *Cestoda* collected from the small intestine of the animals were partly damaged owing to the autopsy being carried out relatively late (3 to 5 days after the animals were shot). This particularly applied to the juvenile forms. The tapeworms collected were stained with lactic-acid carmine after Blachin, a part of the material was stained with alum carmine and creosote clarified.

The nematodes were preserved in 75 per cent. alcohol with 5 per cent. of glycerol added; by gradually evaporating the alcohol, a pure glycerol lighting was obtained.

The following species were found:

### *Hydatigera laticollis* Rudolphi 1819

One whole specimen was found, 280 mm. in length, and another — 170 mm., as well as 9 scolices with fragments of strobila. Five specimens were used for carrying out the measurements. The following are the results: the rostellum — 0.4 to 0.8 mm. in diameter, armed with a double crown of 32 to 40 hooks; the large hooks — 0.441 to 0.445 mm. in length, the small ones — 0.264 to 0.266 mm. A distinct neck could be seen in some specimens fixed while they were extended, similarly as observed by Skinker 1935. Width of the proglottides directly following the scolex (in contracted specimens) ranged from 1.0 to 1.3 mm. The proglottides measured 1.6 — 2.8 by 0.3 — 0.5 mm. at a distance of 21.0 mm. from the suckers. The bursa cirri was 0.503 mm. long. The uteral proglottides measured 4.2 — 4.5 by 3.0 — 3.5 mm.; the uterus had 7 to 8 ramifications, with secondary ramifications, on each side. The eggs measured 0.032 to 0.033 mm.

In another description of *H. laticollis*, Skinker 1935 gave significantly smaller dimensions of hooks (0.390 — 0.415 for the large hooks, and 0.214 — — 0.238 mm. for the small ones) situated within the usual limits in *Hydatigera taeniaeformis* Batsch 1786 as mentioned by Joyeux et Baer 1936 (0.315 — 0.485 mm.); also the bursa cirri length was markedly more significant (Skinker 1935: 0.275 — 0.293 mm.) while the number of the uteral ramifications was smaller (Skinker 1935: 10 to 15 on each side). Nevertheless, taking into account the study by Joyeux et Baer 1937 (emphasizing the only constant feature drawing distinctions between the two species to be the absence of the sphincter vaginae in *H. laticollis*) the material examined had been classified as *Hydatigera laticollis* Rudolphi 1819 solely because of the absence of the sphincter vaginae. According to Joyeux et Baer 1937 only the presence or absence of the sphincter vaginae is a reliable character allowing to draw differences between these very variable species.

Host: *F. sylvestris* × *F. catus;* Bieszczady Mountains, Otryt in the Carpathians.

Location: small intestine.

### *Taenia rileyi* Loewen 1929

Five scolices were found with strobilae 5.0 to 20.0 mm. in length as well as numerous fragments of strobilae (15) 1.0 to 20.5 mm. in length. Measurements were carried out on five specimens. The following are the results: the scolex — 0.949 to 1.203 mm. in diameter; the rostellum — 0.493 to 0.650 mm. in diameter, armed with two crowns of 19 or 20 hooks. The large hooks — — 0.363 to 0.371 mm. in length, and the small ones — 0.210 to 0.221 mm. Dimensions of the suckers — 0.277 to 0.314 mm. The length of the neck —

— 1.5 to 2.0 mm. The dimensions of proglottides at 5.0 mm. distance from the rostellum: 0.601 to 0.634 × 0.417 to 0.478 mm. The inner structure could not be traced back as only juvenile proglottides occurred in the material available.

It results from Loewen's 1929 description as well as from comparison of the descriptions of other species of genus *Taenia* that the most important distinctive features are: dimensions of the large hooks and those of the small ones; the rostellum and, in sexual proglottides, the arrangement of testes („Testes do not extend posterior of ovaries or vitellarium", Loewen 1929). Taking into consideration the above mentioned dimensions (almost identical with, or laying within the limits of, the Loewen's 1929 data), the present author considers it possible to designate the material studied as *Taenia rileyi* Loewen 1929 on the grounds of those dimensions.

It may be seen from the literature available that this species has been described for the first time in Europe, and in a new host: *Lynx lynx* L.

Host: *Lynx lynx* L.; Białystok Palatinate.

Location: small intestine.

### *Mesocestoides* sp.

Approximately 100 scolices with necks were found; the dimensions were: length of scolex — 0.185 to 0.223, width — 0.185 to 0.231, length of neck — 1.0 to 1.2 mm. On one occasion proglottides with the dimensions: 0.226 × 0.370; 0.231 × 0.349; 0.224 × 0.353 mm., were observed at a distance of 3.7 to 5.2 mm. from the scolex. These proglottides contained each 39 to 47 indistinctly marked testes 0.02 to 0.03 mm. in diameter, an indistinctly shaped bilobated ovary, and an indistinctly demarkated, undeveloped bursa cirri situated frontally at the middle line of the proglottide. The tapeworms found are presumed to represent the juvenile form of *Mesocestoides litteratus* Batsch 1786 taking into account the number of testes in the proglottides.

Host: *F. sylvestris* × *F. catus*; Majdan in the Western Carpathians.

Location: small intestine.

### *Ancylostoma (Ancylostoma) tubaeforme* (Zeder 1800)

Syn. *Ancylostoma balsami* (Parona et Grassi 1877); *Ancylostoma caninum* (Ercolani 1859) pro parte.

The species definition of the material collected was carried out in accordance with the re-description by Biocca 1954 who has declared erroneous the present day practice considering as synonyms the species *Strongylus tubaeformis* Zeder 1800 and *Ancylostoma caninum* (Ercolani 1859).

19 females and 10 males were found. Measurements were carried out on seven females and seven males. Somewhat wider measurement limits may be seen in the present author's study (length of gullet, of tail, of spicula, of gubernaculum, and dorsal rib bifurcation, see Table I) as compared to the measurements and description by Biocca 1954. Describing the differences in structure in *A. (A.) tubaeforme* and *A. (A.) caninum* bursa copulatrix,

Biocca 1954 stated the ratio of the distance between the costa posterolateralis end and the costa mediolateralis on the one hand to that between the costa mediolateralis and the costa anterolateralis on the other was the characteristic feature distinguishing one species from the other, the distance ratio being 1 : 1.5 for *A.* (*A.*) *caninum*, and 1 : 2 for *A.* (*A.*) *tubaeforme*. However, my own observations showed this rule to be very inconstant, and its application possible only in conditions when the measurements were to be carried out on both of the lateral lobes. For, on some occasions, the distance ratios were 1:1.57, 1:1.6 and 1:1.8 for the costae ends on the one side while they were 1:2, 1:2 and 1:2.8 on the other. Consequently, the above taxonomic feature is to be approached very cautiously.

Table I

Dimensions of Ancylostoma (Ancylostoma) tubaeforme (Zeder 1800) - in mm.

| | Males | | Females | |
|---|---|---|---|---|
| | Fagasiński | Biocca 1954 | Fagasiński | Biocca 1954 |
| Body length | 6.2-10.0 | 7.0-12.0 | 11.0-13.5 | 9.0-13.0 |
| Body breadth in the vulva region | | | 0.391-0.505 | 0.330-0.440 |
| Body breadth in the bursa copulatrix region | 0.249-0.359 | 0.30-0.38 | | |
| Oral pouch length | 0.161-0.169 | | 0.192-0.198 | |
| Oral pouch breadth | 0.111-0.132 | | 0.138-0.157 | |
| Pharynx length | 0.647-0.787 | 0.71-0.80 | 0.768-0.863 | 0.780-0.820 |
| Pharynx breadth | 0.115-0.159 | | 0.136-0.192 | |
| Vulva - hind end of the body space | | | 3.80-4.62 | |
| Body breadth in the anal region | | | 0.109-0.126 | |
| Tail length | | | 0.126-0.160 | 0.145-0.185 |
| Spiculee - length | 1.171-1.497 | 1.2-1.5 | | |
| Gubernaculum length | 0.062-0.081 | 0.085-0.095 | | |
| Gubernaculum breadth | 0.020-0.029 | 0.018-0.022 | | |
| Costa dorsalis - ramification | 0.039-0.050 | 0.050-0.060 | | |

Thus, the most important characteristic features distinguishing *A.* (*A.*) *tubaeforme* from *A.* (*A.*) *caninum* ought to be seen in the oesophagus being proportionally considerably longer in *A.* (*A.*) *caninum* (Biocca 1954) than in *A.* (*A.*) *tubaeforme*, and in the distinct difference in spicule length: 0.600 to 0.900 (Schwartz 1927), 0.910 (Biocca 1954) in *A.* (*A.*) *caninum*, and 1.171 (Fagasiński), 1.500 (Biocca 1954) in *A.* (*A.*) *tubaeforme*.

The dimensions of eggs (in utero), as measured by the present author, 0.060 to 0.064 by 0.032 to 0.044 mm., were somewhat smaller than those established by Biocca 1954 — 0.058 to 0.068 by 0.036 to 0.044 mm. and by Böhm 1954 — 0.06027 to 0.06635 by 0.03616 to 0.04340 (the latter author's data concerned eggs extracted from faeces of cat).

Host: *F. sylvestris* × *F. catus*; Otryt, Bieszczady Mountains.

Location: small intestine.

*Toxocara cati* (Schrank 1788)

Seventeen of these nematodes (7 of them — males) were found in a male lynx, and 14 specimens (5 males) — in female lynx; 13 specimens (5 males) were found in a wildcat from Otryt in the Carpathians, and in another wildcat from Majdan (the W. Carpathians) 124 mature specimens were found (of which 5 males), 12 to 65 mm. long, and 63 juvenile forms with cuticle heavily damaged, and with inner structure effaced owing to the effect of intestinal juice.

Table II

Dimensions of juvenile forms of Toxocara cati (Schrank 1788) - in mm.

| | Males | Females |
|---|---|---|
| Body length | 12.0-14.2 | 12.8-14.6 |
| Body breadth - maxim. | 0.192-0.290 | 0.213-0.311 |
| Body breadth in the front region | 0.104-0.123 | 0.098-0.134 |
| Pharynx - length | 1.182-1.382 | 1.171-1.401 |
| Ventriculus | 0.153-0.209 × 0.128-0.142 | 0.130-0.170 × 0.102-0.167 |
| Head alae | 0.046-0.090 × 0.693-1.033 | 0.050-0.092 × 0.633-0.979 |
| Vulva - end of the body space | | 3.75-4.59 |
| Tail | | 0.159-0.470 × 0.092-0.230 |
| Phasmidia - end of the body space | | 0.050-0.192 |
| Spiculae | 0.638-1.209 | |

Taking into consideration that Sprent 1956 gave only a general description of the juvenile stages of grown-up *Toxocara cati* (Schrank 1788), the measurements of ten males and ten females will be given in the present paper (see Table II; the specimens utilized for measurements were 12.0 to 14.6 mm. in length). The head alae outline resembling the shape of an elongated arrow tip (disregarding their insignificant width), in the material examined, ought to be noted for Sprent 1956 observed such a shape in 25 mm. long specimens and in grown-up forms. Distinctly visible pre- and post-anal papillae could be seen on the hind part of the body of the males in the material examined: they were identical in shape with the grown-up form. Two phasmidia could be distinctly seen on the tail of the females.

Host: *Lynx lynx* L. and *F. sylvestris* × *F. catus*.

Location: small intestine.

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## STRESZCZENIE

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